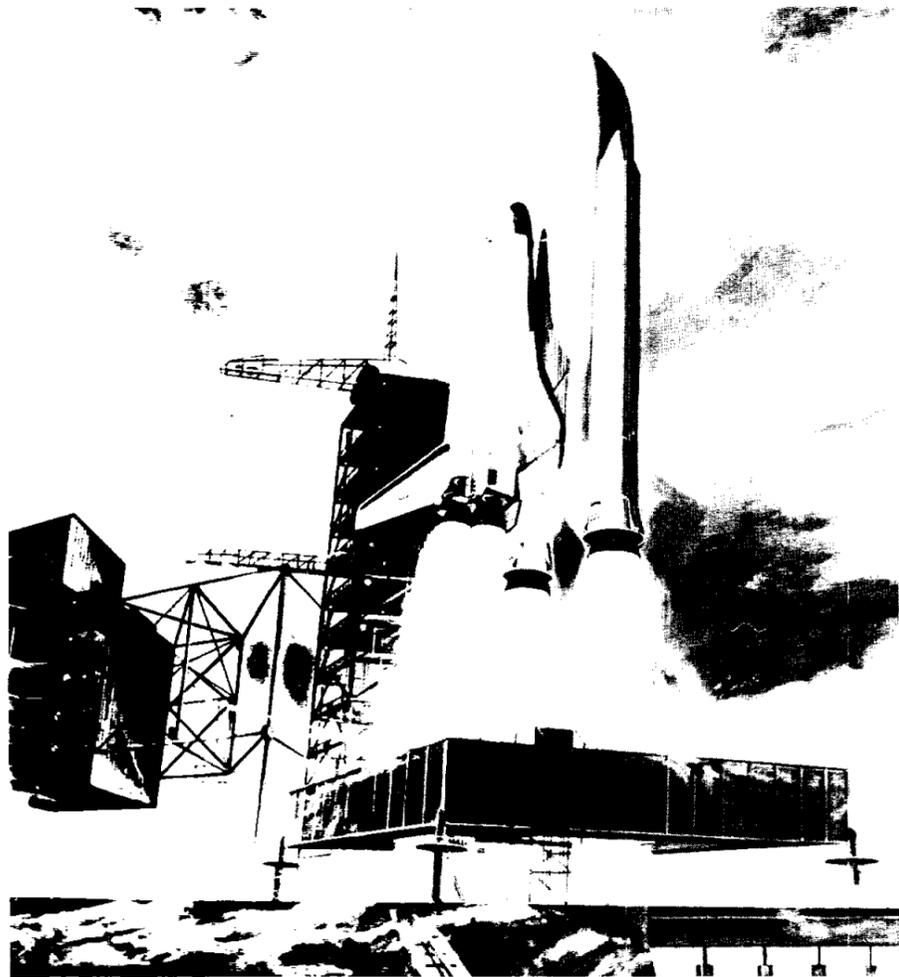


# It's "GO" for Young, Crippen & Columbia



(John Young and Bob Crippen, prime crew for STS-1, held a final press conference before the mission. They outlined the mission from beginning to end, their training, their personal feelings, and their hopes for the future on the U.S. space program. Following are excerpts.)

## Launch set for dawn + 45 minutes

The Space Shuttle Orbiter Columbia, first in a planned fleet of spacecraft in the nation's Space Transportation System, lifts off on its first orbital shakedown flight early next month. Launch will be no earlier than 45 minutes after sunrise from the NASA Kennedy Space Center Launch Complex 39A.

Crew for the first orbital flight will be John W. Young, commander, veteran of two Gemini and two Apollo space flights, and U.S. Navy Capt. Robert L. Crippen, pilot. Crippen has not flown in space.

Columbia will have no payloads on the payload bay on this first orbital flight, but will carry instrumentation for measuring orbiter systems performance in space and during its glide through the atmosphere to a landing after 54-1/2 hours.

### Extensive Testing

Extensive testing of orbiter systems, including the space radiators and other heat rejection systems, fills most of the STS-1 mission timeline. The clamshell-like doors on Columbia's 4.6 by 18-meter (15 by 60-foot) payload bay will be opened and closed twice during the flight for testing door actuators and latch mechanisms in the space environment.

Other tests will measure performance of maneuvering and attitude thrusters, the Columbia's computer array and avionics "black boxes," and, during entry, silica-tile heatshield temperatures.

The first of four engineering test flights, STS-1, will be launched into a 40.3 degree inclination orbit circularized first at 241 kilometers (130 nautical miles) and later boosted to 278 km (150 nm). Columbia will be used in these four test flights in proving the combined booster and orbiter combination before the Space Transportation System becomes operational with STS-5, now forecast for launch in September 1982.

After "tower clear" the launch team in the Kennedy Space Center Firing Room will hand over STS-1 control to flight controllers in the Mission Control Center, Houston, for the remainder of the flight.

### Hand Over

Columbia's two orbital maneuvering system hypergolic engines will fire at approximately 53 1/2 hours over the Indian Ocean to bring the spacecraft to a landing on Rogers Dry Lake at Edwards Air Force Base, Calif., an hour later. The approach to landing will cross the California coast near Big Sur at 42,670 m (140,000 ft.) altitude, pass over Bakersfield and Mojave, and end with a sweeping 225-degree left turn onto final approach.

### Optional Manual

Young and Crippen will land Columbia manually on this first test flight. A microwave landing system on the ground will be the primary landing aid in subsequent flights, with optional manual takeover. Kennedy landing teams will remove the flight crew and "safe" the orbiter after landing.

The first three test flights land on Rogers Dry Lake, the fourth on the main runway at Edwards Air Force Base, and STS-5 will land on the 4,570-m (15,000-ft.) concrete Shuttle Landing Facility runway at Kennedy Space Center.

STS-1 will be the first manned flight using solid rocket boosters. No previous U.S. space vehicle has been manned on its maiden flight.

STS-1 will be launched from Pad A at the Kennedy Space Center's Launch

**Young:** The mission is two-and-a-half-days, 36 orbits, 54-1/2 hours from liftoff to touchdown. There are about 170 detailed flight objectives in the operational flight test program, and this mission has been designed to accomplish about 130.

The next mission, STS-2, will involve an Earth orbital or reconnaissance package. We think we need to be pressing on down to get the space shuttle operational as soon as practical, and we believe that the design of this mission is such that we can certainly do that.

**Query:** Under what conditions will you go EVA? It's not planned, is it?

**Crippen:** Right now the only condition that will cause us to go EVA is if we run into a problem with closing the payload bay doors. There are several things that could be associated with that, all the way from a latch not working properly to the door motors themselves not working. Anything associated with the doors would cause us to go EVA, but again that's a very unlikely circumstance, because there are several backups that would have to fail before you would get in that position.

**Young:** And we're hoping the engineers will come in and tell us the analysis shows that maybe some of those latch groups aren't critical on the payload bay doors, so if they don't work, we may not have to go EVA anyway. Just leave them open on entry. I don't think you'd do it for ascent, but for entry, it's certainly a possibility.

**Query:** Bob Crippen, you mentioned that this crew has been trained the longest of any crew for any single flight. Is there a point where that becomes a disadvantage?

**Crippen:** As far as I'm concerned, probably never. It's a very complicated spacecraft, and when we initially started training, the training devices were not fully developed. We were primarily doing bookwork kind of training. Also, in terms of its complexity, it is the extended training time that has allowed us to prepare for much more catastrophic kinds of emergencies. John would say that if we'd been as well prepared back on Apollo 13, instead of the guys calling down and saying, "Houston, we've got a problem," they would have called up and said, "Houston, we're on Mal Number 5332, Block 8, taping up the lyle canisters." We've got contingency programs where we're well prepared to handle just about anything, and the extended time has given us that capability.

**Query:** Can one of you describe in some detail the three abort modes you have?

**Crippen:** Well, you have at least three abort modes. The first is the return to landing site abort, if you lose a single engine going out to the Cape prior to press for MECO which is normally around four minutes and 20 seconds or earlier. To return to landing site abort, you fly on down range, expend your fuel with one engine out, pitch around turn, and turn back toward the Cape. You'll be coming in at about 200 miles, separate the tank at Mach six and a half. You do a 50 degree angle of attack 2-G pullup, and then fly right straight into the Cape and land. When you finish the pullup, you're about 170 out and you just fly right back into the Cape and land. And there then is the abort once around, which is also in case there's an engine out after RTLS and abort once around overlap. If you lose this engine, you fly around and land at your abort once around end of mission site which right now is Northrup Strip, White

See PRIME CREW Page 2

## NASA Lyndon B. Johnson Space Center Space News Roundup

Vol. 20 No. 7 March 27, 1981 National Aeronautics and Space Administration



"GO" FOR SHUTTLE — John Young and Robert Crippen, ready as they'll ever be, continue training for their 54-hour mission that will start up the space transportation era. If all goes well, they'll orbit Earth 36 times and land at Edwards Air Force Base, California.

## Manned Flight Awareness

The dry countdown demonstration test and hydraulic power unit (HPU) hot firing conducted at KSC March 19 was successful.

Repair of the external tank began March 9 and was completed Monday with critical tank and detank procedures to follow. With detanking completed, tests and inspections will begin to assure satisfactory bonding.

The flight readiness review for STS-1 is scheduled for Tuesday March 31 at KSC. This review is the final milestone in preparation for the launch. If no major problems are encountered, the launch countdown sequence will begin.

## Secretaries stress "The Missing Link"

Professional Secretaries International (PSI) will sponsor its 11th annual seminar Saturday, April 25, at the Nassau Bay Motor Resort. Registration begins 8 a.m. Seminar theme is, "The Missing Link — The Professional Secretary." Speakers are: Virginia Hughes, coordinator for the Federal Women's Program, Claire Wickline, consultant with M. David Lowe Personnel Services and Margaret Monte, CPS, President of the Texas-Louisiana Division of PSI. The seminar is for women in all working fields of business and covers the importance of secretaries in the business world today.

Registration fees, which include luncheon and materials, are \$25 for non-PSI members; \$20 for PSI members and \$10 for FSA members.

Registration deadline is April 16. Checks should be sent to Elaine Ragan - WT3 or Karen Lai - JM6.

See "GO" Page 4

Sands, New Mexico. And then there's abort to orbit. If you lose the engine later on down, you abort to orbit. The altitude is 105 miles circular which is a lot less but enough to stay up there for a couple of days and if you have extra propellant which you can evaluate in real time, you can raise the orbit up until you can fly a nominal mission.

**Query:** Bob, John, I wonder if either of you ever stops to think about the implications of what you are about to do. Specifically, this is the first of a kind. Do you ever stop to think about things like that?

**Young:** Well, I tell you, I've thought for about 10 years about what this vehicle is going to be to the United States. There's no question in my mind that the capability to put 65,000 pounds in low Earth orbit, to put payloads up there much more cheaply than we've been able to do it before, not having to throw away the booster, will absolutely revolutionize the way we do business here on the Earth in ways that we just can't even imagine. It's going to be a remarkable thing, I can tell you that, and I've been thinking about it a lot. I really believe in it. It's quite a capability. It'll immeasurably improve the defensive capability of the country. It will help develop science and technology. I believe with the space shuttle, when we get in operational, we'll be able to do in five to 10 years what would take 20 to 30 years to do otherwise in science and technology development in space — things that we couldn't do if we didn't have the space shuttle and that payload capability. I believe we'll do all those things, and the sooner we do all those things, the better off the country's going to be.

**Query:** Much has been said that this vehicle makes you much more a pilot, much less a passenger. Would you tell me about that?

**Crippen:** From a pilot's standpoint, it's much more aesthetically pleasing to land on a runway than it is to pop out some parachutes and get dumped in the ocean. It is still a very automated vehicle, and the crew's function primarily is to monitor that everything is going satisfactorily. I mentioned earlier some little discrete events that we have to participate in to get it back down. Still our primary function is monitoring that everything is okay. It does involve piloting skills in terms of being able to back up all the nominal functions. The crew can take it over and fly it all the way from liftoff to landing. Nominally, on the first flight, we will be in the automatic mode up until we basically get over our landing site somewhere around 40,000 feet, at which time John will take over and pilot the Columbia to a landing, but from the standpoint of a pilot, we're happy to be participating in this particular program.

**Query:** Could you two gentlemen talk about what your routine will be between now and the launch date?

**Young:** This afternoon we're doing ascent skills Number 12. Tomorrow from one to six we're doing integrated entry simulations with mission control. We're doing ejection seat review from 8 to 9:30 on Wednesday. We're participating in integrated abort simulations from 8 to 12 Thursday. And Wednesday afternoon we're flying the shuttle training airplane out at White Sands Missile Range. On Friday, Thursday evening right now, we're set up to depart the Ellington Air Force Base to arrive at Kennedy Space Center to participate in the first ascent launch

readiness verification test in Columbia Friday morning. Probably Saturday and Sunday we'll be participating in those tests. That's just next week. The government has a way of filling up the time allotted between now and launch with training and things to do some how.

**Query:** One of you has been in space four times, Mr. Young, and Capt. Crippen, you haven't gone yet. To what extent have you developed a sort of old pro and rookie relationship so familiar to watchers?

**Crippen:** Well, I can say from my standpoint, it's really an honor and a privilege to get to fly with somebody like John Young who's got all the experience and the knowledge that he has. Not only that, he's a real great guy to work with. I guess working together for three years, we've had a chance to come to know one another very well, and I think we function well as a team.

**Query:** Have there been any occasions when Mr. Young has had to reassure you as to the safety of the endeavor?

**Young:** Actually, he reassures me.

**Query:** When will you be coming to the Cape for launch, how far in advance of the launch itself?

**Young:** We plan to be down there nominally two and a half days ahead of time. We'll fly the T-38 the afternoon that we arrive down there, we'll fly the shuttle training airplane the next morning. We'll participate in a lot of briefings on systems and weather that afternoon, and of course, the next morning is launch morning.

**Query:** When do you go into any kind of quarantine to make sure that the flu bug doesn't scuttle three years of training?

**Crippen:** Right now we're scheduled to go into quarantine seven days prior to launch.

**Query:** John, you have said that part of the enjoyment for you in the game was the problem-solving, working the engineering difficulties. Are you going to miss them after you have the first mission out of the way?

**Young:** The space business is such that with the new payloads coming along and the many things that we can do with a space shuttle, such as putting up large orbiting space stations very cheaply and inexpensively, I'm sure that we will always be in the same boat and we'll be trying to get the most for our dollar out of engineering fixes. Therefore, we'll probably always end up solving engineering problems. That's the name of the game.

**Query:** For Bob Crippen: Do you expect to be flying DOD related shuttle missions?

**Crippen:** The current plan is for the shuttle crews to be selected for all flights from both the NASA civilian and DOD personnel out of the office. It is my understanding that DOD has requested that their flights be done by military folks, of which I am still one. I hope to get the privilege of carrying some.

**Query:** John, do you have any plans to enrich Bob's menu while on the flight?

**Young:** Actually, our menus are enriched far beyond anything my feeble mind could think up. The food on there is unbelievable. Rita Rapp has done a tremendous job and there is some really good food on there. And when you have a food warmer, you have hot meals every day, and it's very nice. Bob is the chef on the flight and he can really warm some grits, I'll tell you.

**Crippen:** I can make up a mean corned beef sandwich and we've got corned beef onboard, too.



**Clifford E. Charlesworth, Deputy Director, is presented life insurance policies by A. William Rose, Sales Manager, Home Life Insurance Company. Policies provide increased spouse coverage of \$15,000 (effective Oct. 1, 1980), for Texas residents, offered by the NASA Employees Benefit Association.**

**Query:** I know your basic objective in this mission is to get up and get down, but, could you be a little bit more specific as to what sequence of events during the flight would amount to a successful mission?

**Crippen:** Well, as far as John and I are concerned, if we get up and get down, and the vehicle is in good shape to go back up again, that's a successful mission. We specifically are going to be going through and checking out every system we have onboard, from the solid rockets that lift us off to the waste management system. I guess we could end up running into problems with any of those. The main thing we want to do is to find out where, if any problems do exist with the space shuttle, so that we can put it into an operational state as soon as possible. As far as I'm concerned, the prime thing is to get it back so that Joe Engle and Dick Truly can take it up again to fly STS-2.

**Query:** There is no dividing line, then? No specific dividing line in terms of, say, the number of orbits, between success and failure in this flight?

**Young:** No, and this being the first flight it is a very conservatively planned mission. We're planning to come home every day. We have six to seven orbits per day when we can come into the United States into our contingency landing sites around the world which are Naval Station Roda, Cadina in Okinawa, and Hickam Field in Honolulu. We can come in and there is scarcely an orbit goes by we couldn't come down if we had a serious problem. And it would have to be very serious to come into one of those contingency landing sites, because most of the time, even with a serious problem, we can wait on orbit to come in to our end of mission sites in the United States. And that's what we would do. But the mission is planned so that if there are a lot of equipment failures, we'll just patch it up and come home; and we have the capability to handle a lot of equipment failures, too. Our in-flight maintenance book reads like a Funk and Wagnells. It's a big book and we can take care of a lot of things ourselves on orbit. If they get so serious we can't, we'll come back. Our mission rules are set up so that with very few equipment failures the first day, we'll come back the next day. The same way towards the end of mission.

**Crippen:** As John said, they have designed the mission so that it is very conservative. If we get a couple of significant failures, we'll come home in the first day, probably on the fifth revolution. And if we get just basically one failure of any significance, we plan to come home on the second day. The odds, the way we've designed the mission right now are that we will probably come home early. Just about anything could break, and we would decide to go ahead and terminate it. Of course, we also have a way here at the center of evaluating where we're at during the mission, and we may end up electing in real time to change some of those rules.

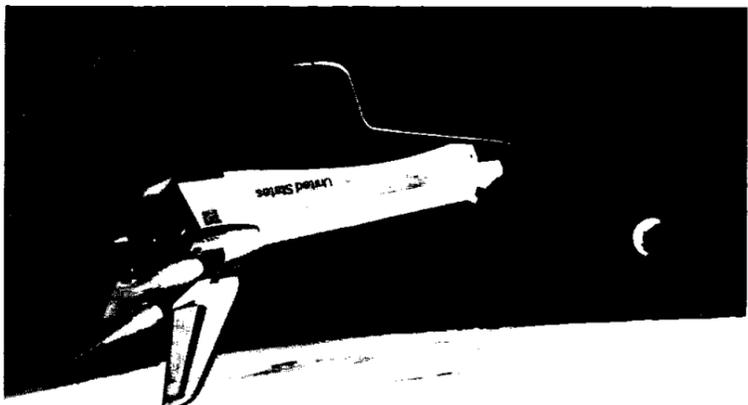
**Query:** With budget cuts, will you cut out certain flights in order to fly other missions? There is some rumor in Washington that missions such as Galileo to visit Jupiter and land unmanned was saved by cut-

ting back on the number of shuttle flights per year?

**Young:** It's news to me. How are you going to put Galileo up if you don't fly it on the shuttle? Let me tell you how that works. People will buy flights on the shuttle—the commercial people and the Department of Defense—and if NASA doesn't have any planetary payloads, I imagine there won't be any shuttle flights for those. All the rest of them are going to be flown because they already have been paid for by the users. In first 48 flights, there are very few interplanetary missions. They are all paid for by commercial users or the Department of Defense. You can't back out on any of those.

**PAO:** Thank you very much. We'll now proceed with a short photo session.

**Crippen:** Here we go again. Seems like we've been here before.



## Cookin' in the cafeteria

### Week of March 30 - April 3, 1981

**Monday:** Cream of Celery Soup; Braised Beef Ribs; Chicken a la King; Enchiladas w/Chili; Italian Cutlet (Special); Brussels Sprouts; Navy Beans; Whipped Potatoes. Standard Daily Items: Roast Beef; Baked Ham; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

**Tuesday:** Beef & Barley Soup; Turkey & Dressing; Country Style Steak; Beef Ravioli; Stuffed Cabbage (Special); Corn Cobette; Okra & Tomatoes; French Beans.

**Wednesday:** Seafood Gumbo; Catfish w/Hush Puppies; Roast Pork w/Dressing; Chinese Pepper Steak (Special); Broccoli; Macaroni & Cheese; Stewed Tomatoes.

**Thursday:** Cream of Tomato Soup; Beef Tacos; BBQ Ham Slice; Hungarian Goulash; Chicken Fried Steak (Special); Spinach; Pinto Beans; Beets.

**Friday:** Seafood Gumbo; Liver w/Onions; Deviled Crabs; Roast Beef w/Dressing; Seafood Platter; Tuna & Noodle Casserole (Special); Whipped Potatoes; Peas; Cauliflower.

**\*\* Menu subject to change without notice.**

### Week of April 6 - 10, 1981

**Monday:** French Onion Soup; Beef Chop Suey; Polish Sausage w/German Potato Salad; Breaded Veal Cutlet (Special); Okra & Tomatoes; Green Peas. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches & Pies.

**Tuesday:** Split Pea Soup; Shrimp Creole; Salisbury Steak; Fried Chicken (Special); Mixed Vegetables; Beets; Whipped Potatoes.

**Wednesday:** Seafood Gumbo; Fried Catfish w/Hush Puppies; Braised Beef Rib; BBQ Plate; Weiners & Beans; Shrimp Salad; Stuffed Bell Pepper (Special); Corn O'Brian; Rice; Italian Green Beans.

**Thursday:** Chicken Noodle Soup; Beef Stroganoff; Turkey & Dressing; BBQ Smoked Link (Special); Lima Beans; Buttered Squash; Spanish Rice.

**Friday:** Seafood Gumbo; Broiled Turbot; Liver w/Onions; Seafood Platter; Fried Shrimp; Meat Sauce & Spaghetti (Special); Green Beans; Buttered Broccoli; Whipped Potatoes.

# Bulletin Board

## See Theatre at the Equinox at a Discount for JSC Employees

Group rates are available through the Equinox Theatre, and JSC employees can attend for \$1 off the regular price on Wednesday and Thursday nights. The theatre is at 3617 Washington in Houston, 868-5829. Contact Doris Wood at SN1 for further information.

## Committee on Drugs and Alcohol Needs Volunteers

Spring training classes for Crisis Helpline volunteers begins Monday April 13. Crisis Helpline is a crisis intervention service manned by para-professional volunteers. Their offices are in the Clear Lake area, and they need volunteers. Call 488-7222 if you would like to help individuals in the Houston area by talking them through bad periods or referring them to professional help.

## 1981 Blood Drive Begins

The first JSC Blood Drive of 1981 is Thursday, April 2, 8 a.m. to 4 p.m. in Gilruth Center. For an appointment, call Bob Jones at x6364 or Helen Crawford x3159. The schedule for the rest of 1981 is on page 44 of the JSC phone book.

## Toastmasters Excel in Speech Contest

At the Area One Spring Speech Contest held March 12, Emmet Fisher took first place with his exciting motivational speech entitled, "If you Want to Succeed, Don't Quit." Emmet will now represent Area One in the Eastern Division Spring Speech Contest April 11. Congratulations and good luck. Also, Sharon Babb took second place as an evaluator.

The club meets the first and third Wednesdays of each month at Franco's Pizza, 1101 NASA Road One. Call Steve Jacobs at x3561 for information.

**Softball Registration** - is now being conducted at the Gilruth Recreation Center for the first of two seasons. Registration will be accepted from March 27 to April 10, for men's, women's and mixed teams. Cost is \$100 for EAA teams and \$150 for non-EAA teams. Season is expected to begin on April 20. Please note that use of softball fields is by reservation only. Teams must be registered before they can reserve the fields.

**NIRA Photo Contest** - A chance for all NASA photographers to exhibit their talents in a nationwide photo contest, sponsored by the National Industrial Recreation Association. Deadline for entries is April 17. Call x3594 for entry blanks.

**Children's Easter Egg Hunt & Party** will be held at the Gilruth Recreation Center on Saturday, April 11 from 9 to noon. Features of this year's program include a puppet show, the Walt Disney classic "101 Dalmations," as well as the traditional Easter egg hunt & baskets. Tickets are now on sale at the Bldg. 11 Exchange Store at a cost of \$2 per person.

**Nostalgia Dance** - You only have until April 1 to get your tickets for the EAA Nostalgia Dance to be held at the Gilruth Recreation Center on April 4. Fifties and sixties music will be provided by the Joey Long band, as well as the DJ Travlyn Disco. For those with the competitive spirit, the night will feature a costume contest, a hula hoop contest, and a dance contest. The cost is \$10 per ticket and includes a roast beef dinner, beverages, and entertainment. Tickets are now on sale at the Bldg. 11 Exchange Store.

**Inter Center Race** - It's time to break out your running shoes and run in the 11th Inter Center Running Competition. Races will

be conducted daily from April 6 - 18 to give as many folks as possible a chance to represent JSC against all other Centers. Race distances are two mile and ten Km. Trophies will again be awarded to the large and small NASA divisions, as well as the large and small contractors having the most employees run. Call x3594 for schedules and more details.

## Mexico By Ocean Cruise

Thirty-nine maritime ports of entry into Mexico constitute an important access for seagoing travelers. Located along approximately 4500 miles of coastline, their beauty and tourism interest is just recently attracting world attention.

The ports that receive the greatest number of passengers are the Island of Cozumel, entry to Mexico's lush Caribbean and Mayan areas; Cabo San Lucas where the cliffs rising out of the sea join the Mar de Cortes with the Pacific Ocean; and Acapulco with its combination of tropical excitement and modern comfort.

Not only cruise ships but smaller pleasure craft are arriving in ever increasing numbers to explore this country's unspoiled and sparsely populated coastal regions.

Registration is being accepted in the following leisure time classes:

**Aerobic Dance** - Vacancies still exist in this class which is part exercise, part dance, and all fun. Class meets Tuesdays and Thursdays from 7-8 p.m.. Cost is \$24 for this six-week course.

**Country-Western Dance** - Learn the popular C & W dance steps. This course lasts for four weeks, with two hour classes every Monday beginning April 27. Beginners dance from 7-9 p.m. and Intermediates from 9-11 p.m.. Cost is \$18 per couple.

**Tennis Lessons** - are available to three levels of tennis players: Beginners - designed for persons who have not taken formal lessons. Course meets on Tuesdays from 5:15 - 6:45 p.m.

Advanced Beginners - designed for people who have had some formal instruction and wish to continue. Class meets on Wednesdays from 5:15-6:45 p.m.

Intermediates - Designed for those who want to work on a particular aspect of their tennis game. Class meets on Thursdays from 5:15-6:45 p.m.

All courses are eight weeks long and begin during the week of April 6. Cost is \$24 per course.

# Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

## Boats & Planes

Boat for sale - 24' Searay, excellent condition, w/boat lift. Call after 6 p.m. 333-5373.

1979 Ebbtide 16 ft./80 hp. Mercury o/b excellent condition, low time, garaged. \$4395 with ski equipment. Crimmel x3035 or 334-5964.

1977 20 hp. Mercury o/b motor plus accessories manual start excellent condition. \$800 Hyams 486-5964.

For sale Airplane 1/2 interest in D-35 Bonanza. Based at Houston Gulf \$29,500. 488-3265.

Wanted small conventional fishing/skiing I/O preferred, no bass boat call C.W. x4105, 643-8944.

Aluminum boat, 14 ft. flat bottom, 10 hp. Johnson & trailer \$500 Steve x3212 or x5936.

## Carpools

Interested in forming or joining a non-smoking carpool from Houston Heights to JSC. Beverly x2728.

Three person carpool seeking two others to join from Alvin 7:30 to 4:00 - Call Joe Gillis x4721 or 331-5784.

## Cars & Trucks

1974 TL-Renault, 42K miles, very good condition \$1700. 2-door fastback, Mary x5021.

1980 Ford T-Bird, Town Landau, light gray, silver roof, 8000+ miles. Dick x7241, Vera 333-8459, or 333-3024 after 5 p.m.

Wanted: 74, 75, or 76 Toyota Celica for parts, Thompson x4823 or 332-2229.

1977 F-150 Ford 1/2 ton PU with fiberglass Gem Top shell Very low mileage-uses regular gas-many extras. 485-6423.

76 Pontiac Sunbird, auto, P/S, tilt, sunroof, mag wheels, new steel-belted radials, 21+ mpg, \$2600-, x2217 or 482-8457 after 4, John.

Sharp 1977 Chev. Chevette hatchback. Jim x4947 or 480-2927.

77 Datsun, 30 mpg new tires (raised-white-letters) 35k mil a/c excellent condition, sporty \$2800 call Wright x4105, 643- 8944.

79 VW Rabbit 4-speed, regular fuel inj-air AM/FM 2 dr custom very clean 3,200 Walt 331-1092.

1977 Ply. Voyager Window Van - AM/FM stereo 8 track, pb, ps, ac, 2 captain chairs, loaded. Irma x3448 or 482-6659

1975 Dodge Colt, clean, yellow 65k, no air, AM/FM 8 track call after 6 p.m. 488-6483.

1976 Jeep Cherokee, 4wd, 360 auto, air, ps, pb, 2 barrelcarb, 13 mpg, regular gas, reasonable offers considered 337-1840.

67 Dodge passenger van, two bench seats, ac, auto \$800. John 488-0559 or x4393.

'77 Linc town car, moon roof, opera windows, all extras. Clean. Less than \$1/lb. \$3950. Ask for Dorothy, 488-9771.

66 Buick Skylark, auto, ps, pb, 87,000 mi, runs well but needs new exhaust manifold to pass inspection \$350 or make offer. Phil x4801 or 333-2476 after 5.

## Cycles

Bicycle for sale: 20" girls bicycle. Good condition. \$35. 333-5373 after 6 p.m. - Kay.

Moped Cycle, like new, approx 1000 miles, 130 mpg. \$400. Malone 483-3216.

Motorcycle trailer - 3 bike big wheel, excellent cond. \$250 x2569 or 333-3426 Dean.

77 Suzuki GS-550, 18k miles, 800 Ron x6204 or 480-4267.

77 Suzuki RM-80, good condition, \$300 McNeely x5954/482-1549.

## Household Articles

Kitchenette set/4 chairs \$50 excellent condition. 333-3426 x2569 Dean.

Sears 72 Lady Kenmore washing machine, excellent condition Avocado, \$100, x5931/482-4941.

Student Desk, Walnut, 7 drawers, \$50. Good condition, Malone, 483-3216.

Quilt-Handmade, standard size bed. \$100. 643-7460 after 5:30 all day week-ends.

Kingsize bed Mediterranean style headboard and matching dresser mirror. Like new. Both for \$50. Bobola x4501.

Kenmore dishwasher, avocado with power miser switch, 4 yrs. old \$80. Call 554-6894.

Antique dining chairs, mahogany (4) \$60. each; golden oak chairs (2) \$50. each. Mary Turpin 944-0820.

HeathkitGR-295 23" color set, maple cabinet, new picture tube works great, extra tubes. Joe x3576.

Sony 19" Triniton color TV like new, KV-1910, 4 yrs. old, but used less than two weeks. \$375 John 488-0559 or x4393.

Large two burner coleman white gas camp stove, excellent condition \$17. John 488-0559 or x4393.

25" Sylvania color T.V. good condition \$150. Dave x2631/482-5218.

Kenmore washer, heavy duty, 4 cycle, excellent condition \$275. 485-2987 after 5 p.m.

Binks Lo Boy air compressor w/6 hp. B&S engine \$700. Rogers x2653 after 5 - 485-9446.

Sofa 100" long, blue-green print velvet cover, excellent condition, \$180. Corner-table, 2 tier, solid black fair condition \$25. Eggleston 482-4239.

## Lost and Found

LOST: Red leather address book. 5x7 spiral. Irreplaceable; invaluable to owner. Please call x2708 or 488-0219 Ransdell.

LOST: Gold S-Chain bracelet in Bldg. 9 or adjacent parking lots on March 10-11. If found call Renee x5808.

## Musical Instruments

Baldwin "Interlude" organ, excellent condition. Beautiful looks and sound. Originally \$1500. Now \$600. Malone. 483-3216.

For Sale: Newman piano, antique blue \$300. Call 332-8618 after 5

Yamaha PF2 studio upright piano. Modern styling walnut finish. Excellent cond. R. Arnold x4141 or 333-5682 (eves).

Bundy Trumpet & case excel. cond. \$110 Vic Booth x5231 or 334-4734.

Clarinet & case good condition. Sold for best offer. Call x5040 after 6 call 741-9586 Judy.

## Personals:

My family and I wish to express our thanks to the people in the logistics division for their help. V. Preiss.

## Pets

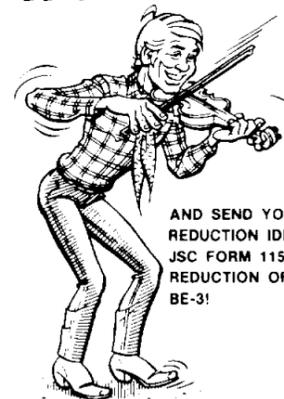
Lost: Two brown Pekingese dogs (male & female) in Clear Lake City Oak Brook West on March 15. George x2931 or 486-8054.

Brittany Spaniel Pups, Reg. Available April 3rd males \$150, females \$125. Brady x4895 585-3124 after 6.

Basenji Puppies, AKC registered, seven weeks, 3 females 1 male \$150. x3265 or 332-8767 after 5.

Silky Terrier AKC, champion bloodline. Female, 9 wks. old brown & black then silver (longhair) at 9 months. \$400. 488-2387.

## WHY DON'T YOU STOP FIDDLELING AROUND?



AND SEND YOUR COST REDUCTION IDEA ON A JSC FORM 1150 TO COST REDUCTION OFFICE AT BE-3!

Cartoon by Russ Byrner

## Property & Rentals

Rent/Lease: 3-2-2, a/c, new carpets and mini-blinds large fenced yard, detached garage, water paid. \$474/mo plus deposit. 488-2139 after 2 pm.

Condo for lease: 2-2, fireplace, new carpet, 5 min. from NASA Pebblebrook Condos. \$390/mo + deposit. 486-1370 days, ask for Larry.

Lease/Sale: Forest Bend, 3-2-1/2-2cp. Townhouse, formal LR Den, Refrig. Pool Park, Maintenance. \$425/mo plus deposit. 333-2322.

Galveston By-the-Sea Condominium Two bedroom furnished apartment for rent by day, week or month. Clements 474-2622.

Lease: Fairmont Park, 3-2-2, custom drapes, carpeted, dishwasher, garbage disposal, fenced, separate dining, living and den \$475. No pets. Call 471-4598.

Wanted: housing or bedroom accommodations for summer ASEE faculty fellows. Mid-June through August. Nancy x4724.

Summer Faculty Fellow, spouse and two (2) children seek summer sublet or rental of furnished house or apartment. Write Dr. T. Blackburn, Rt. 6 Box 127 A, Laurinburg N.C., 28352 or call Collect (919) 276-6439 Eve.

## Stereos & Cameras

Radio Shack am/fm, 8 track stereo tuner & speaker excellent con. \$70. 333-3426 or x2569 Dean.

For Sale: Ronkor lens 35mm F2.8 for Minolta, plus filter sun shade, adapter ring \$60. Jim Bates x4601 or 944-4687 after 5:30 pm.

Wanted Nikon lenses, telephoto, X2 etc. Call C.W. x4105 or 643-8944.

For sale Minolta Tripod \$40. Bonnie x5844, Home: 332-8291.

## Miscellaneous

Riding Lawn Mower, 26 in. Craftsman, 7 hp, \$350. Eggleston 482-4239.

For Sale: 8x12 orange area rug \$30; 6x9 red area rug \$20; 8x12 carpet mat \$10; 8x10 Camper Awning & poles \$30. Room air conditioning (used 1 season) 180 toy box with 3 book shelves \$30. 946-6814.

Sears 1/2 HP air compressor, 2.8 CFM at 40 PSI, 100 PSI max, \$50. McNeely x5954 or 482-1549.

HUFFY riding lawnmower, 24 inch good shape 195 call Sauer X2759 or 554-6290 after 5.

Diamond solitaire pendant, .73 ct marquis. Appraised at \$3500, asking \$2000. Call 486-1306 ask for Melba.

New picture frame, 24x48 \$12. Thompson, x4823 or 332-2229.

HP-25 programmable calculator for sale. Excellent condition complete with soft carrying case; rechargeable battery, charger; instruction manuals and in original carton. \$50 Call Joe at 483-6406 or 944-6513.

Plant Sale: 2000 plants, hanging baskets, starter plants small & large potted begonias. 18127 Hereford Ln. Nassau Bay, April 3&4 X2267.

For sale Girls 26" 3 speed "Free Spirit" bicycle, well used as is (H) 471-3303 (O) X2394.

1000 3 cent mint U.S. commemorative stamps (50 ea. per issue). \$35. Excellent for collectors or for postage. Jeff X7429 or 482-5393.

Tennis rackets head edge alum. 45/8, \$32 Davis pro wood 45/8 \$20 Zrubek 333-2549 or X3669.

"20" girls bike like new \$40. X5231 or 334-4734.

Infant boy and girls clothes Little girl dresses-2-6X all in excellent cond. 488-6521.

Swap: Wurlitzer electronic organ 2-keyboard, foot pedals walnut for motorcycle, 750 or larger in good cond. 482-3678.

## Wanted

Wanted to buy: Dynaco FM-5 FM tuner with documentation. Must be working. Jim Bates X4601 or 944-4687 after 5:30.

Would like to buy a good child's wagon. Grissom x3141.

Roommate needed to share 2-2 furnished till 6/17. 1 mile to gate \$139 month after 5. 480-3281.

Wanted: Weight set, 150 lbs min. Ph. Rick 333-3056.

Volume 1, No. 7, dated January 24, 1962, of the "Roundup" call Cecil Roby x4626.

Roundup deadline is the first Wednesday after publication.



The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees.

# "GO" *Continued from Page 1*

Complex 39 no earlier than the week of April 5, 1981. Launch windows open at local sunrise plus 45 minutes and are more than 6 hours in duration.

Among the key considerations in establishing the launch windows are lighting conditions which will permit engineering photographic documentation at the launch site, provide adequate lighting for a landing at the Northrup Strip at the White Sands Missile Range, N.M., in the event of an Abort Once Around, and provide for adequate lighting for a landing at the end of the nominal mission at the Dryden Flight Research Center, Edwards Air Force Base, Calif.

Windows for the week of April 5, which are about one minute earlier each day, are as follows:

Window Open (EST)	Duration (Hours)
April 5 0653	6.5
April 6 0652	6.6
April 7 0651	6.6
April 8 0650	6.6
April 9 0649	6.6

STS-1 will be launched on a relative flight azimuth varying from 58 to 66 degrees east of north between liftoff, solid rocket booster jettison and main engine cutoff. The orbit at Space Shuttle main engine cutoff will have a relative azimuth (heading) of 66 degrees east of north and be inclined 40.3 degrees to the equator.

The accompanying graph illustrates the time, altitude, relative velocity and downrange distance for the major events in the flight ascent profile. The solid rocket boosters, jettisoned 2 minutes, 12 seconds, after liftoff will impact on the Atlantic Ocean 5 minutes, 11 seconds, after separation at a downrange distance of approximately 256 km (160 mi.).

The external tank jettisoned 8 minutes, 50 seconds, after liftoff will be on a suborbital trajectory that results in an impact location of the Indian Ocean.

## FLIGHT PROFILE

During the second orbit Columbia's payload bay doors will be opened, and the space radiators will take over the job of dumping systems and metabolic heat into space. Except for lining up for an Orbital Maneuvering System burn or inertial platform alignment, Columbia will spend most of its first flight with her topside and open payload bay doors facing Earth. Much of the engineering data expected from STS-1 are measurements of how well Orbiter thermal loads are handled by the space radiators, flash evaporators and ammonia boiler heat rejection systems.

Young and Crippen will remove their escape pressure suits three and a half hours after launch, and except for a suit donning/doffing checkout early in the second day of flight, will wear the two-piece flight coveralls until again donning pressure suits four hours before entry and landing.

A carry-on food warmer will be used for the first several flights until the Orbiter galley is installed. The STS-1 crew will sleep in their flight deck seats rather than in sleep restraints on the lower deck planned for later flights. Flight plan updates will be uplinked by Mission Control Center, Houston, to a teleprinter aboard Columbia.

In addition to extensive Orbiter systems tests and performance measurements planned for STS-1, Columbia's ability to hold attitude will be tested several times during the flight. Steady attitude control will be essential for operating many planned scientific experiments that require accurate pointing, and for future rendezvous with other space vehicles.

Columbia's payload bay doors will be closed about four hours prior to landing. A 91-meter-per-second (299-feet-per-sec-

ond) Orbital Maneuvering System retrograde deorbit burn at 2 days, 5 hours, 27 minutes over the Indian Ocean will bring Columbia to a landing an hour later on the hard-packed sand of Rogers Dry Lake at Edwards Air Force Base, Calif. Columbia will touch down at 185 knots (213 mph) with a vertical sink rate of .23 m/s (2.4 fps). Young and Crippen will fly a manually-controlled landing.

## IF THINGS DON'T GO RIGHT

STS-1 flight planners have attempted to anticipate any possible contingency that could happen during the flight — from premature main engine shutdown to a sudden desert cloudburst making a wet lake of Rogers Dry Lake.

"What ifs" have been a central part of each mission design from the outset of Project Mercury 20 years ago and continuing through Gemini, Apollo and Skylab. While there were no launch-phase aborts in any of these programs, the cryogenic oxygen tank explosion aboard Apollo 13 and the ensuing use of the lunar module as a lifeboat, proved that contingency planning and training do pay off.

## About-to-Orbit

The preferred type of launch abort for Shuttle launches is the abort-to-orbit (ATO) in which enough main engine and orbital maneuvering system engine energy is available to reach a 194-km (105-nm) orbit, but not enough to get the nominal 278-km (150-nm) orbit. An abort-to-orbit would be called for if one main engine should shut down before enough velocity is reached to yield a 278-km (150-nm) orbit.

Slightly less available energy for orbit insertion because of an earlier failure of a single main engine would force an abort-once-around (AOA) situation in which Columbia would land near the end of one orbit at Northrup Strip on the U.S. Army White Sands Missile Range, N.M. Abort-once-around would also be used for any time-critical Orbiter systems failures requiring immediate deorbit and landing. Northrup Strip is also the backup landing site in case Rogers Lake at Edwards is wet.

## When Edwards?

Still earlier shutdown of a single main engine brings about the more critical return-to-launch-site (RTL) abort. The vehicle would be turned around while thrusting and then glide back toward the Shuttle Landing Facility at Kennedy Space Center.

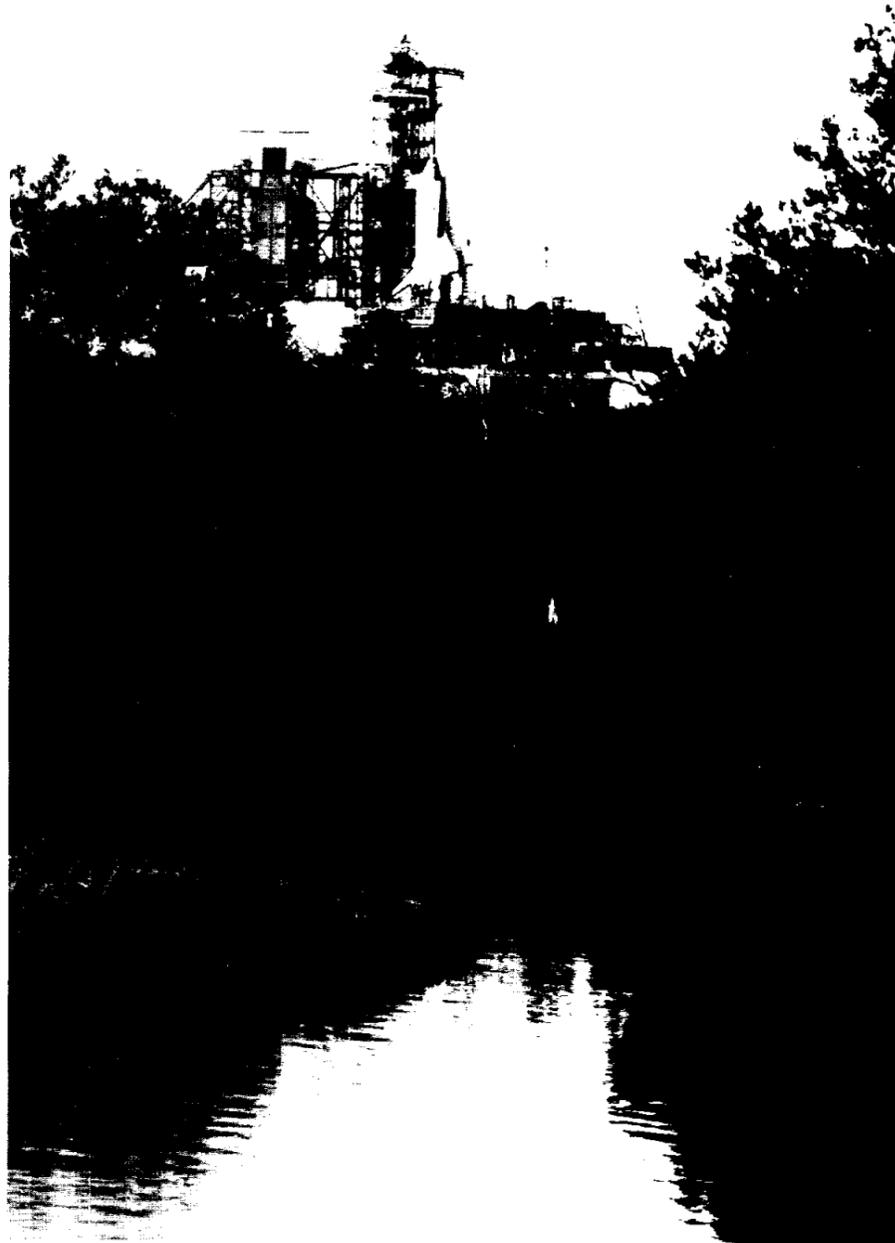
Once the decision to abort had been made, Columbia and the external tank would be flown in a pitch-around maneuver to heads-up and pointed back along the ground track to Cape Canaveral. The remaining two functioning main engines would cancel out the eastward velocity and accelerate the vehicle in a westward direction until enough velocity and distance is reached to glide along a normal entry trajectory to the Kennedy runway. Orbiter systems failures during ascent could also force a return-to-launch-site abort.

Loss of control or impending catastrophic failure during ascent, from clearing the launch pad service structure up to an altitude of 30,480 m (100,000 ft.), calls for crew ejection. Loss of two main engines prior to seven minutes of flight would also require crew ejection.

Shuttle abort philosophy emphasizes safe return of the flight crew, the Orbiter and its payloads to an intact landing at either the prime landing site at Edwards, the backup site at White Sands, or the contingency landing sites at Hickam Air Force Base, Hawaii; Rota, Spain; and Kadena Air Base, Ryuku Islands.

## Early Shutdown

A situation such as a systems failure forcing landing on the first day of flight would mean landing at Edwards at the



Space Shuttle Orbiter on Launch Pad for STS-1

end of the fifth orbit.

As a hedge against the payload doors failure to open after Columbia is in orbit, additional portable water tanks have been loaded for the flash evaporators. The flash evaporators transfer metabolic and systems heat from Freon loops to water when the payload doors are closed. Space radiators are attached to the inside of the payload bay doors for heat rejection when the doors are open.

## Sticky Doors

If the payload bay doors fail to open during the second orbit, Columbia would be brought down to a landing at Edwards at the end of the fifth orbit. Failure of the payload bay doors to close would call for cabin depressurization to 9 psi and Crippen's spacewalk 14 hours later to unjam the doors.

Except for developmental flight instrumentation and the aerodynamic coefficient identification package, Columbia's payload bay will be bare.

Columbia's propellant tanks are scheduled to be loaded with super-cold liquid hydrogen and oxygen today, duplicating procedures on launch day. An earlier loading test Wednesday was completed to make sure new insulation panels bonded to the external tank's aluminum skin would stay on during loading.

Repair of the external tank's insulation was completed Tuesday.

Technicians also began stowing equipment to be used by the flight crew on this first mission. Two Extravehicular Mobility Units (EMU's), the type of spacesuit donned by astronauts if they need to leave the pressurized cabin, were to be installed in the orbiter this week.

Cables are being installed to trigger pyrotechnic devices in the hold-down posts. Once the Shuttle's three main engines have built up to flight thrust, the pyrotechnic devices are exploded releasing the entire Space Shuttle for flight.

# 12 Launches Scheduled for 1981

Tentative schedule for expendable rockets calls for nine additional satellite launches from NASA facilities on Cape Canaveral Air Force Station and three from the Western Test Range (WTR) at Vandenberg Air Force Base, for the remainder of 1981. Launch vehicles include Delta, Atlas-Centaur and Atlas-F rockets.

Of the Delta rocket payloads, three are commercial communications spacecraft, one is a U.S. government weather observation spacecraft and one is a scientific satellite.

Four of the programmed Atlas-Centaur launches will carry international communications spacecraft for the INTELSAT

consortium, and the fifth will carry a military communications satellite. The Atlas-F will carry a weather satellite.

All nine spacecraft to be launched from Kennedy Space Center facilities on Cape Canaveral AFS are intended for placement in circular, geostationary orbits 22,250 miles over the equator. Satellites launched from the WTR are intended for polar orbits.

Delta launches are conducted from Complex 17 and Atlas-Centaur missions are launched from Complex 36 on the Cape. Atlas-F and Delta rocket launches from the WTR utilize complexes on Vandenberg Air Force Base.